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ANTHRACNOSE OF MUSK- MELONS

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ATTACHMENT OF THE MAYOR

OF THE CITY OF NEW YORK



OFFICE OF THE MAYOR
CITY OF NEW YORK

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of the City of New York, this 1st day of May, 1901.

JOHN A. BROWN

Mayor of the City of New York

ANTHRACNOSE OF MUSKMELONS.

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WHAT IS ANTHRACNOSE OF MUSKMELONS?

Anthracnose of the muskmelon is a disease caused by a mold or fungus.¹ It affects all parts of the plant, leaf, stem, and fruit. Anthracnose of the cucumber and the watermelon differs but slightly from muskmelon anthracnose and is caused by the same fungus.

WHAT IS THE EFFECT OF THE DISEASE ON THE FRUIT?

Anthracnose renders affected fruit unsalable, or at least lowers its selling price and often causes its complete decay. Frequently the parts bordering diseased tissues have a disagreeable taste. On the fruit the disease appears as more or less oval light-gray spots, which later become sharply sunken and are marked by pink or black concentric rings or dots. The pink dots or ridges are heaps of the seed bodies or spores of the fungus, whereas the black ones are the pads which bore the spores. (Pl. I, A and C.) Frequently numerous small disease spots merge into a single large one. In advanced stages the anthracnose spot is a dry rot, becomes deeply sunken, cracks, and opens the way for other decay organisms, which lead to a rapid dry or wet rot of the entire melon.

¹ This fungus is known as *Colletotrichum lagenarium*. A fungus (plural, fungi) is a small, simple plant which lacks the green color found in more complex plants, such as our orchard, field, and garden crops. Molds, yeasts, toadstools, and mushrooms are good examples of fungi. Fungi can not make their own food, as green plants do, and many of them obtain it from living plants or their dead remains. Those fungi which obtain their food and energy from living plants are known as parasites, while the plants upon which they grow and feed are known as their hosts. Such fungi usually cause harmful changes in the structure, composition, and activities of their hosts, which are known as lesions. Such lesions constitute the disease. Thus, in anthracnose of muskmelon fruits the fungus *Colletotrichum lagenarium* is the parasite which attacks and feeds upon its host, the muskmelon, causing spots, or lesions, which are manifestations of the disease.

WHAT IS THE EFFECT OF THE DISEASE ON THE PLANT?

Anthrachnose frequently decreases the yield, and under weather conditions favorable for the fungus it may even cause the total loss of entire fields. It is marked by brown spotting, a parched or scorched appearance of the leaves (Pl. I, A), and by deeply sunken dark-colored spots on the leafstalks and stems (Pl. I, B), which frequently lead to girdling. The disease may cause either complete loss of the leaves or death of whole runners.

WHERE AND WHEN DOES THE DISEASE OCCUR?

Anthrachnose causes heavy losses in those melon districts which have a warm and humid or rainy climate during the growing season. It also becomes important in the melon districts of the semiarid irrigated sections whenever heavy rains or dews are frequent during the growing season. It may therefore occur on melons in all parts of the United States, but is most frequent on those grown in the warm humid sections.

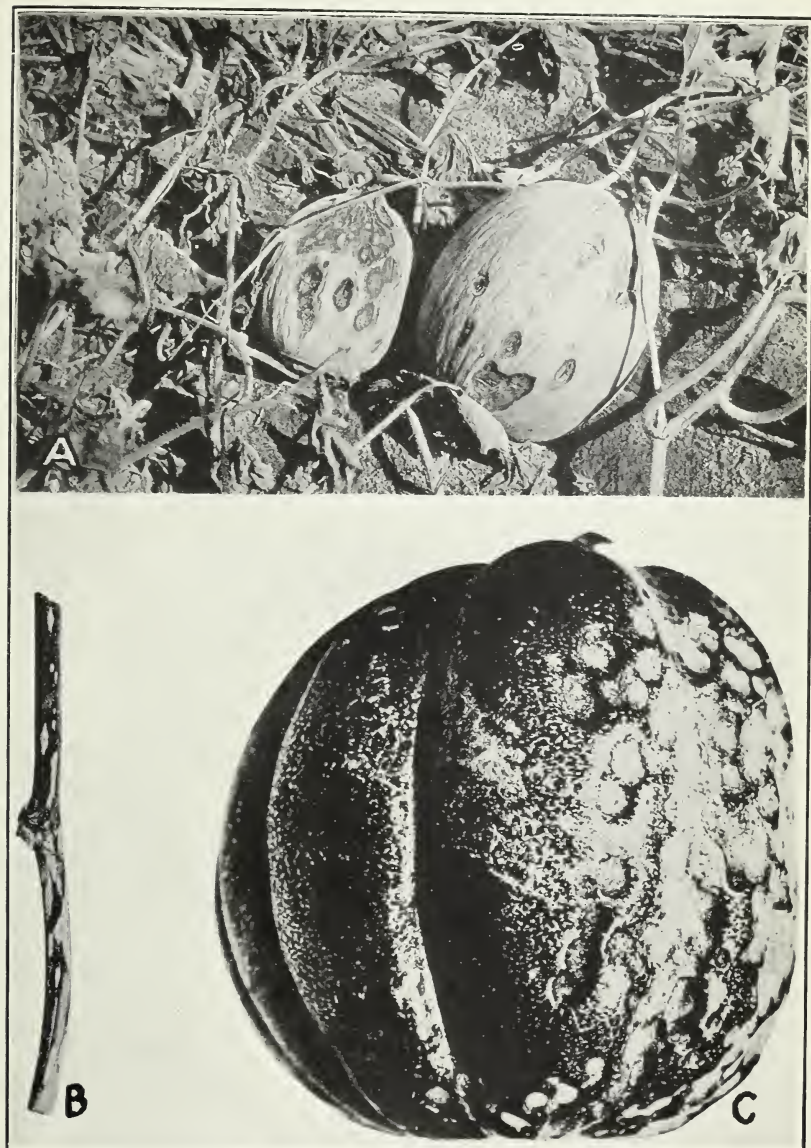
WHERE AND HOW DOES THE DISEASE GET STARTED?

The growing plant gets the disease either from the soil, where the fungus may overwinter on trash from a diseased cucumber, muskmelon, or watermelon crop of the preceding year, from seed which was harvested from diseased melons and which carried the spores of the fungus on its surface, or from near-by cucumber, watermelon, or wild plants of the melon family affected with anthrachnose.

WHERE AND HOW DOES THE DISEASE GET ON THE FRUIT?

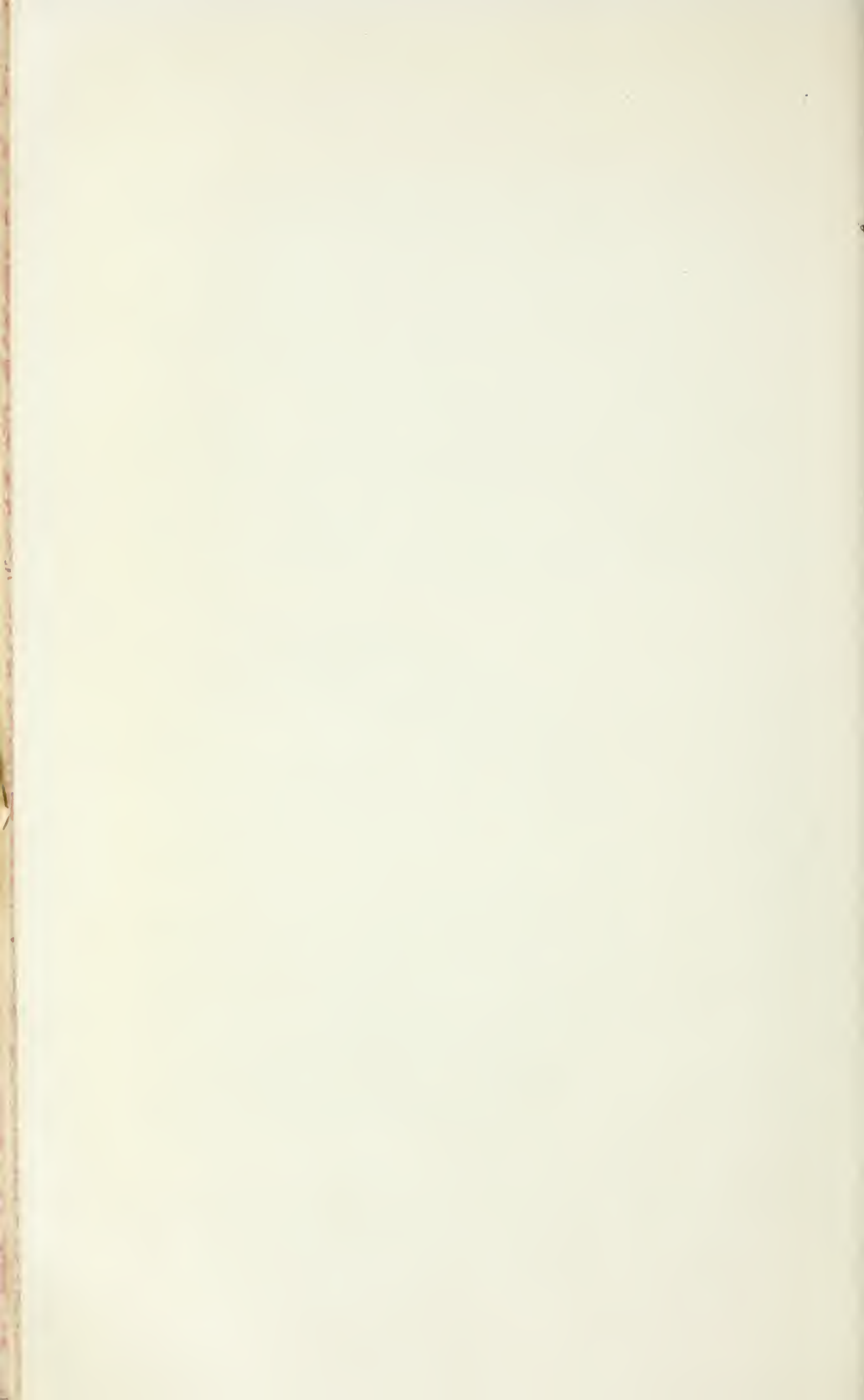
Under favorable conditions the fungus produces its spores or seed bodies in abundance on the leaf and stem spots already mentioned. These spores are washed on to the fruit or into the soil by rains and subsequently may be spattered on to the fruit during heavy rains or be blown on to it with soil particles. The spores may also get on the fruit during the picking and packing process. Fruit carrying the fungus on the surface is said to be contaminated. It is impossible to determine whether fruit is contaminated without making a laboratory examination of it. It is probable, however, that all fruit picked in a diseased field has some spores on the surface, especially if the field is widely and severely affected.

A fruit may be badly contaminated and still be perfectly sound or healthy and remain so. Before the disease can develop in such a fruit, either in the field or after picking, infection must take place; that is, the spores must germinate and the resulting fungus penetrate the rind of the melon and establish itself in its tissues.



ANTHRACNOSE OF THE MUSKMELON.

The disease affects the foliage and stems, causing a blight of the plant. From the vine it spreads to the fruit. A shows casaba melons affected by the disease; B, the characteristic marking of the affected stem; C, a muskmelon on which the fruit spots are well developed.



Laboratory studies indicate that under the most favorable conditions penetration can not take place in less than two days. It is not known whether the infection of contaminated fruit is restricted to the field or whether it also takes place in the packing house and during transit when moist warm conditions prevail.

WHAT FAVORS THE START AND DEVELOPMENT OF THE DISEASE?

The spores of the fungus do not germinate if the temperature is either below 40° or above 86° F. (about 75° F. is the most favorable temperature) or if they are not supplied with moisture and air. Moreover, the fungus can not penetrate the rind of melons if the temperature is below 50° F. Contaminated melons or other parts of the plant, therefore, can not become infected, or, in other words, get the disease, unless they are exposed to temperatures ranging from 50° to 86° F. and are exposed to very moist air or are covered with a film of water, which may be supplied by rain, by dew in the field, or by sweating in transit or storage. It is possible, therefore, that melons may be packed or loaded which are contaminated but which never become infected. Temperatures below 50° or above 86° F., or dryness will bring about such a result.

Some time must elapse after infection has taken place before visible symptoms of the disease appear. Consequently it may happen that melons are picked and packed which look absolutely sound but are infected with the disease and will develop visible signs of it later only if warm humid conditions are encountered. Laboratory studies indicate that the interval between inoculation and the first visible symptoms of disease is at least five days when the temperature and moisture conditions are most favorable.

DOES THE DISEASE DEVELOP AND SPREAD AFTER THE FRUIT IS PICKED?

Every day's delay in getting infected melons to the consumer increases the possibilities of loss, since not only may spots appear but they will also enlarge rapidly under warm moist conditions, increasing the unsightliness of affected fruit and leading to complete decay. Cool dry conditions retard the development of the disease. There are no facts available to justify a more definite statement concerning the relation of temperature, moisture, and time to the development of the disease in the harvested fruits. Neither is it known whether infection takes place in melons which become contaminated after they are packed and loaded.

WHAT SHOULD BE DONE WITH DISEASED FRUIT?

Spotted melons, even though unsightly, are fit for food provided the parts immediately bordering and underlying the spots, which have a disagreeable taste, are cut away. Deeply spotted or severely rotted fruit is not fit for food.

HOW CAN THE DISEASE BE CONTROLLED IN THE FIELD?

Crop rotation is the most important means of control available. Since the fungus overwinters on diseased vines from the crop of the preceding year, no field should be planted to muskmelons following a crop of cucumbers, muskmelons, or watermelons affected with anthracnose.

From our knowledge of cucumber and watermelon anthracnose, it is probable that the use of disease-free seed, the practicing of seed disinfection, and possibly spraying with Bordeaux mixture may reduce the frequency and severity of the disease on muskmelons.

Since it is probable that spores of the fungus are carried on seed obtained from melons affected with anthracnose, only seed gathered from anthracnose-free melons should be planted. If such disease-free seed can not be secured, the seed used should be disinfected by soaking it for five minutes in a solution of mercuric chlorid, 1 part to 1,000 parts of water, after which it should be washed thoroughly in running water and dried.

Spraying with Bordeaux mixture (4 pounds of copper sulphate, 4 pounds of stone lime, and 50 gallons of water) will prevent an outbreak of anthracnose in the field and check it after it has broken out. If spraying is undertaken, it should be remembered that to be effective it must be carefully done, so that both sides of the leaves are thoroughly covered. This is accomplished most effectively if power sprayers are used.

For the details of seed treatment and spraying, the following publications should be consulted:

Anthracnose of Cucurbits. Department Bulletin 727. 1918.

Control of Watermelon Anthracnose by Spraying. Department Circular 90. 1920.

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